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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,354	11/07/2001	Angela Hui	AF01159	1692

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EXAMINER

NGUYEN, KHIEM D

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant No.

10/045,354

Applicant(s)

HUI ET AL.

Examiner

Khiem D Nguyen

Art Unit

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-- **THE MAILING DATE of this communication appears on the cover sheet with the correspondence address --**
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-24 is/are allowed.
- 6) ☒ Claim(s) 1 and 27 is/are rejected.
- 7) ☒ Claim(s) 2-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

The non-final rejection as set forth in paper No. (10) is withdrawn in response to applicants' amendments.

A new rejection is made as set forth in this Office Action.

Claims (1-24 and 27) are pending in the application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (U.S. Patent 6,103,455) in view of Bothra et al. (U.S. Patent 6,057,224).

In re claim 1, Huang discloses a method of stripping a hard mask from a substrate comprising an insulating material (**FIG. 2: 14**) exposed within gaps (**FIG. 2: 39**) patterned through the hard mask (**FIG. 1: 30**), comprising: coating the substrate with a sacrificial material (**FIG. 3: 50**) that fills the gaps; and plasma etching to strip sacrificial material and the hard mask substantially completely using plasma etch process (col. 5, line 16 to col. 7, line 12 and **FIGS. 1-9**).

Huang fails to explicitly disclose plasma etching to strip sacrificial material and the hard mask substantially completely in a single plasma etch process.

Bothra discloses plasma etching to strip sacrificial material and the hard mask substantially completely in a single plasma etch process (col. 4, line 63 to col. 5, line 16

and **FIGS. 2-5**). It would have been obvious to one of ordinary skill in the art of making semiconductor devices to combine the teaching of Huang and Bothra to enable the single plasma etch process step of Huang to be performed and furthermore plug structures can be obtained.

2. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (U.S. Patent 6,103,455) in view of Bothra et al. (U.S. Patent 6,057,224).

In re claim 27, **Huang** discloses a method of stripping a hard mask from a substrate comprising an insulating material (**FIG. 2: 14**) exposed within gaps (**FIG. 2: 39**) patterned through the hard mask (**FIG. 1: 30**), comprising: coating the substrate with a sacrificial material (**FIG. 3: 50**) that fills the gaps; and plasma etching to strip sacrificial material and the hard mask using plasma etch process (col. 5, line 16 to col. 7, line 12 and **FIGS. 1-9**).

Huang fails to explicitly disclose plasma etching to strip sacrificial material and the hard mask in a single plasma etch process.

Bothra discloses plasma etching to strip sacrificial material and the hard mask in a single plasma etch process (col. 4, line 63 to col. 5, line 16 and **FIGS. 2-5**). It would have been obvious to one of ordinary skill in the art of making semiconductor devices to combine the teaching of Huang and Bothra to enable the single plasma etch process step of Huang to be performed and furthermore plug structures can be obtained.

Allowable Subject Matter

Claims 19-24 are allowed.

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Claims 2-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

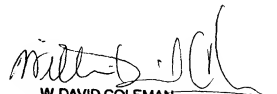
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D Nguyen whose telephone number is (703) 306-0210. The examiner can normally be reached on Monday-Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-9179 for regular communications and (703) 746-9179 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K.N.
November 14, 2003


W. DAVID COLEMAN
PRIMARY EXAMINER